

(11) Document No. AU-B-41250/89  
FFICE (10) Acceptance No. 595779

(Australian Petty Patent)

(54) Title  
SKID STEER EARTH WORKING MACHINE

(51)\* International Patent Classification(s)  
E02F 009/16 B62D 051/02 B62D 051/04

(21) Application No. : 41250/89

(22) Application Date : 11.09.89

(43) Publication Date : 30.11.89

(45) Publication Date of Granted Application : 05.04.90

(62) Related to Division(s) : 22064/83

(71) Applicant(s)  
CLAFTON PTY. LIMITED

(72) Inventor(s)  
KENNETH WILLIAM WHIFFIN

(56) Prior Art Documents  
US 3963131  
US 3319817

(57) Claim

1. A skid steer earth working machine including:
  - a chassis;
  - a pair of driven wheels, or a track, supporting the chassis at each side;
  - drive means for the wheels or tracks;
  - a boom pivotally mounted at an elevated position towards the rear of the chassis on pivots on an axis which is transverse of the chassis;
  - means to raise or lower the boom;
  - a support for a standing operator being provided at the rear of the chassis directly behind the boom which support includes a foot plate below the tops of the wheels or tracks; and
  - controls operable to control the operation of the machine being positioned adjacent the boom pivot points, and
  - operator stabilizing means comprising at least one grab handle provided adjacent said controls.

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Title: "EARTH-WORKING MACHINE"

BACKGROUND OF THE INVENTION

(1) Field of the Invention

This invention relates to an earth-working machine. The invention is particularly useful as a mini-loader which can be operated in restricted areas.

(2) Brief Description of the Prior Art

Small front-end loaders of the type sold under the Registered Trade Marks "Bobcat" (Clark Equipment Co.) and "Mustang" have found ready acceptance in earth-moving applications. However, these loaders are often too large to be used e.g. in domestic gardens or horse stables where only restricted access is available via narrow gate - or doorways. In these installations, any soil, manure, rubbish, or the like must be removed by wheelbarrow.

SUMMARY OF THE PRESENT INVENTION

It is an object of the present invention to provide an earth-working machine which is very compact yet capable of carrying out a wide range of tasks.

It is a preferred object to provide a machine which is highly manoeuvrable and easily controllable.

It is a further preferred object to provide a machine which can be operated by an operator who may stand on a footplate at the rear of the machine or who may walk behind the machine.

It is a still further preferred object to provide a machine with safety (or "deadman's") controls so that the machine will stop if the operator should fall from the machine.

Other preferred objects of the present invention will become apparent from the following description.

In one aspect the present invention resides in a skid steer earth working machine including:

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- a chassis;  
a pair of driven wheels, or a track, supporting the chassis at each side;  
drive means for the wheels or tracks;  
5 a boom pivotally mounted at an elevated position towards the rear of the chassis on pivots on an axis which is transverse of the chassis;  
means to raise or lower the boom;  
a support for a standing operator being provided at the rear of the chassis directly behind the boom which support includes a foot plate below  
10 the tops of the wheels or tracks;  
controls operable to control the operation of the machine being positioned adjacent the boom pivot points,  
and operator stabilizing means comprising at least one grab handle provided adjacent said controls.  
15 Preferably, the operator stabilizing means comprises a pair of L-shaped grab handles with the distal ends thereof being directly adjacent respective control lever pairs which are positioned towards each side of the loader, adjacent the boom pivot points. The operator stabilizing means allow the operator to stabilize himself whilst operating the controls.  
20 Preferably the boom has a pair of substantially parallel lifting arms, pivotally mounted adjacent the rear of the chassis, raised and lowered by respective hydraulic rams. Preferably a tool mounting head is mounted on the forward end of the boom and is provided with a stabilizing linkage which provides a parallelogram type linkage between the chassis and  
25 the head to maintain the attitude of the head to the chassis as the boom is raised and lowered. Preferably the earth moving tool e.g. a bucket, platform, ripping tool or the like is pivotally mounted on the head and  
:....: pivotally movable relative thereto by a hydraulic ram.  
:....: Preferably the controls are mounted at the rear of the chassis and  
30 are self-centering, providing "deadman's" controls stopping the machine if the operator should fall off the machine or fall over.

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### BRIEF DESCRIPTION OF THE DRAWINGS

To enable the invention to be fully understood, a preferred embodiment will now be described with reference to the accompanying drawings, in which:

FIG. 1 is a side view of the machine arranged as a front-end loader with the boom lowered;

FIG. 2 is a similar view but with the boom raised and the bucket lowered to a discharge position;

FIG. 3 is a rear view of the machine;

FIG. 4 is a side view of a post-hole digger attached to the machine;

FIG. 5 is a perspective view of a load-carry platform attachment for the machine; and

FIG. 6 is a side view of a forklift attachment attached to the machine.

### DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT

The loader 10 has a chassis 11 provided with body sides 12 which are triangular in side view, the body sides having panels within a tubular steel frame. A footplate 13 extends rearwardly from the chassis to provide a support for the operator.

The chassis is supported at each corner on ground wheels 14, fitted with pneumatic tyres 15, notably mounted on stub axles 16. The front axles are driven by respective hydraulic motors (not shown), the motors being driven by a hydraulic pump (also not shown) driven by a constant speed petrol engine 17. Chains and sprockets 16a connect the pairs of wheels 14 on each side to provide a skid-steer drive and steering arrangement for the loader.

A pair of lifting arms 18 are pivotally mounted at the apex of the body sides 12 at the rear of the loader. The forward ends of the arms are interconnected by a transverse shaft 19 on which is pivotally mounted a tool mounting head 20. The head 20 has a pair of upright parallel arms 21 pivotally mounted at their lower ends on the shaft

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19 and connected at their upper ends by a shaft 22.

A stabilizing linkage 23 is pivotally mounted at its rear end on a post 24 above the apex of the body sides. The forward end of the linkage 23 is pivotally connected to the parallel arms 21, by a pin 25, to provide a parallelogram arrangement to maintain the attitude of the tool mounting head 20 to the chassis 11 as the lifting arms 18 are raised and lowered by respective hydraulic rams 26 mounted on the body sides 12.

A bucket 27 has a pair of rearward lugs 28 pivotally mounted on the shaft 19. The altitude of the bucket 27 to the tool head 20 is controlled by a hydraulic ram 29 connected at one end to pin 22 and at the other end to a central lug 30, on the rear of the bucket.

A pair of L-shaped grab handles 31 are provided at the rear of the loader. A respective lever 32 on each side controls the drive to the wheels 15 on that side. One lever 33 controls the rams 26 to raise and lower the lifting arms, while the other lever 34 controls the ram 29 which tilts the bucket 27 relative to the tool head 20. All the levers are self-centering to provide "deadman's" controls for the loader.

In use, the operator may ride on the foot plate 13 or walk behind the loader. By operating the levers 32 he can drive and steer the loader and by operating levers 33 and 34 he can control the operation of the bucket 27.

Referring to FIG. 4, a post-hole digger attachment 35 is shown mounted on the tool mounting head 20. The attachment has a tool bar 36 with a pair of rearward lugs 37 pivotally mounted on the shaft 19 and a central lug pivotally connected to the hydraulic ram 29.

A pair of brackets 39 extend forwardly of the tool bar 36 and support a hydraulic motor 40 on pivot pins 41. The motor 40 is driven from the hydraulic pump on the machine via hydraulic hoses 42.

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An auger 43, having a spiral flyte 44 around a central shaft 45, is connected to the motor 40 to drill down through the soil, the depth of the hole drilled being controlled by the rams 26, the auger 46 being maintained vertical by the hydraulic ram 29.

FIG. 5 shows a lifting platform 46 which may be fitted to the tool mounting head, suitable mounting lugs (not shown) being provided on the upright support frame 47.

Referring now to FIG. 6, a pair of lifting forks 48 may be mounted on a modified form 49 of the tool bar 36 of FIG. 4. As shown, the forks may be used to transport pallets 50 or the like supporting e.g. oil drums 51 or waste containers.

Other possible uses are for cleaning out stables, in market gardens and vineyards and for plumbers and drainers.

The loader is extremely compact and may be driven through standard 820mm gates and so is useful for the home gardener or landscaper. The loader has the ability of the "Bobcat" (Registered Trade Mark) type machines, albeit with a smaller capacity, but with the added flexibility of its compact size.

Various changes and modifications may be made to the embodiment described without departing from the scope of the present invention as defined in the appended claims.

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The claims defining the invention are as follows:

1. A skid steer earth working machine including:
  - a chassis;
  - a pair of driven wheels, or a track, supporting the chassis at each side;
  - drive means for the wheels or tracks;
  - a boom pivotally mounted at an elevated position towards the rear of the chassis on pivots on an axis which is transverse of the chassis;
  - means to raise or lower the boom;
  - a support for a standing operator being provided at the rear of the chassis directly behind the boom which support includes a foot plate below the tops of the wheels or tracks; and
  - controls operable to control the operation of the machine being positioned adjacent the boom pivot points, and
  - operator stabilizing means comprising at least one grab handle provided adjacent said controls.

DATED this EIGHTH day of SEPTEMBER 1989

Clifton Pty Limited

Patent Attorneys for the Applicant  
SPRUSON & FERGUSON



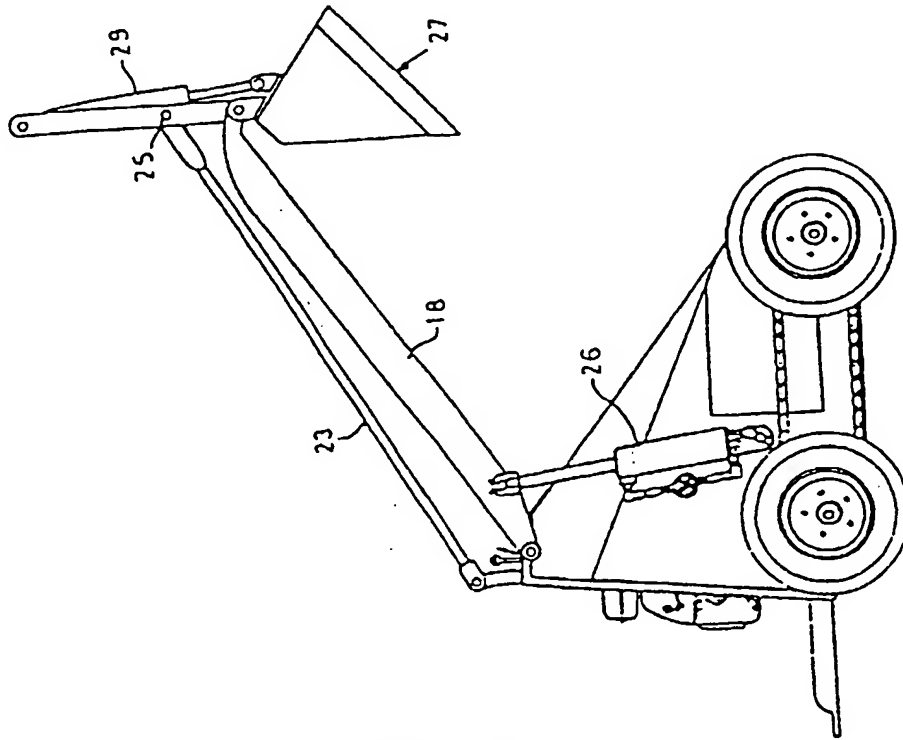


FIG. 2

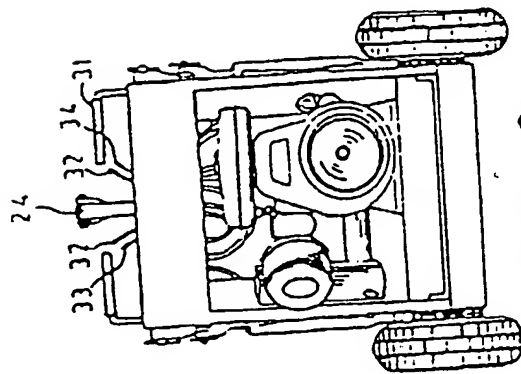


FIG. 3

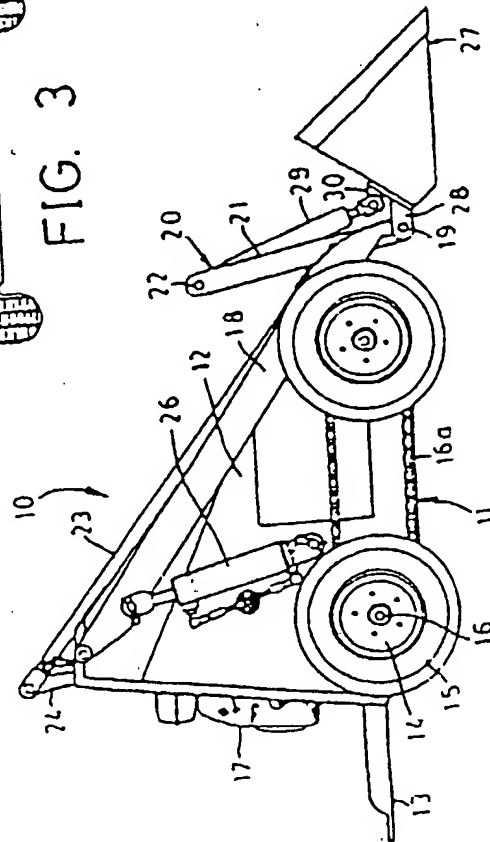


FIG. 1



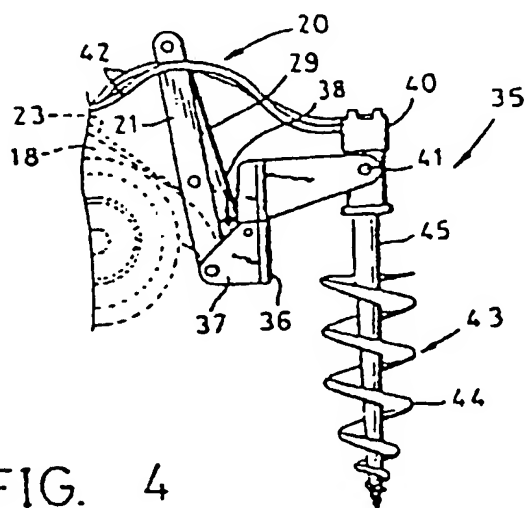


FIG. 4

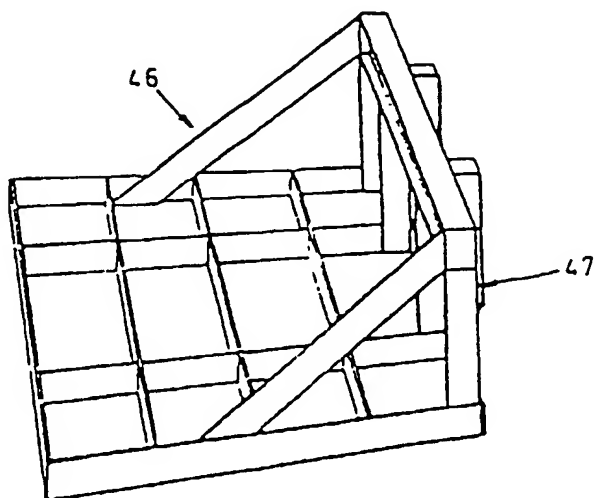


FIG. 5

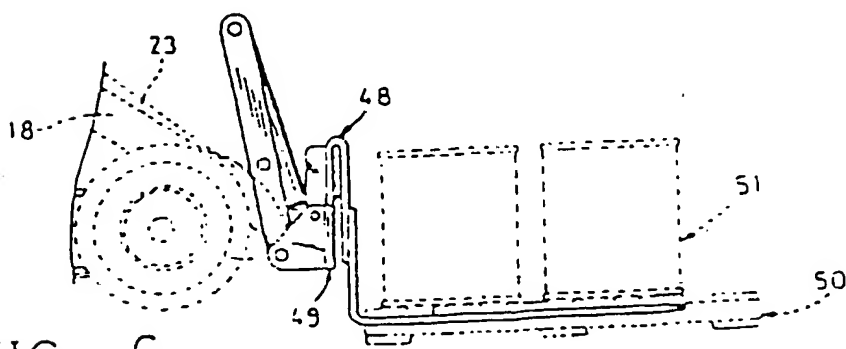


FIG. 6

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